



## Abstract

# Monitoring and Registering of Rumen Movement in Ruminants <sup>†</sup>

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Teams composed of electronic engineers and animal science scientists are nowadays collaborating to find mechanisms that help to understand rumen behavior in order to prevent diseases and improve animal goods. Temperature analysis, internal motility, and chemical composition of rumen, are physical magnitudes of interest.

In this way, this paper presents a system for registering and monitoring the internal motility of the rumen in ruminants using an embedded system with an Inertial Measurement Unit (IMU). The total system is composed of an electronic bolus (the device introduced to the ruminant) and an external base station (attached to the ruminant). The bolus is configured as an embedded system with an IMU responsible for registering the rumen motility. The external host registers (using a second IMU) the animal movements. Rumen behavior and ruminant movement are separated in a posterior data process.

An RF link at 433 MHz is used to maintain communication between the bolus and external base station. This flag-based communication is used to synchronize the ruminant and rumen movements registered by the IMUs.

In the end, the paper shows results obtained in real experimentation performed in collaboration with the Animal Science Department of our university.

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